

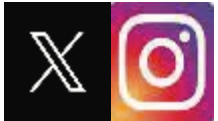
# Biomagnification of potentially toxic elements from Tahmoor Colliery, Bargo NSW, Australia

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5/3/2024






# Platypus fun facts

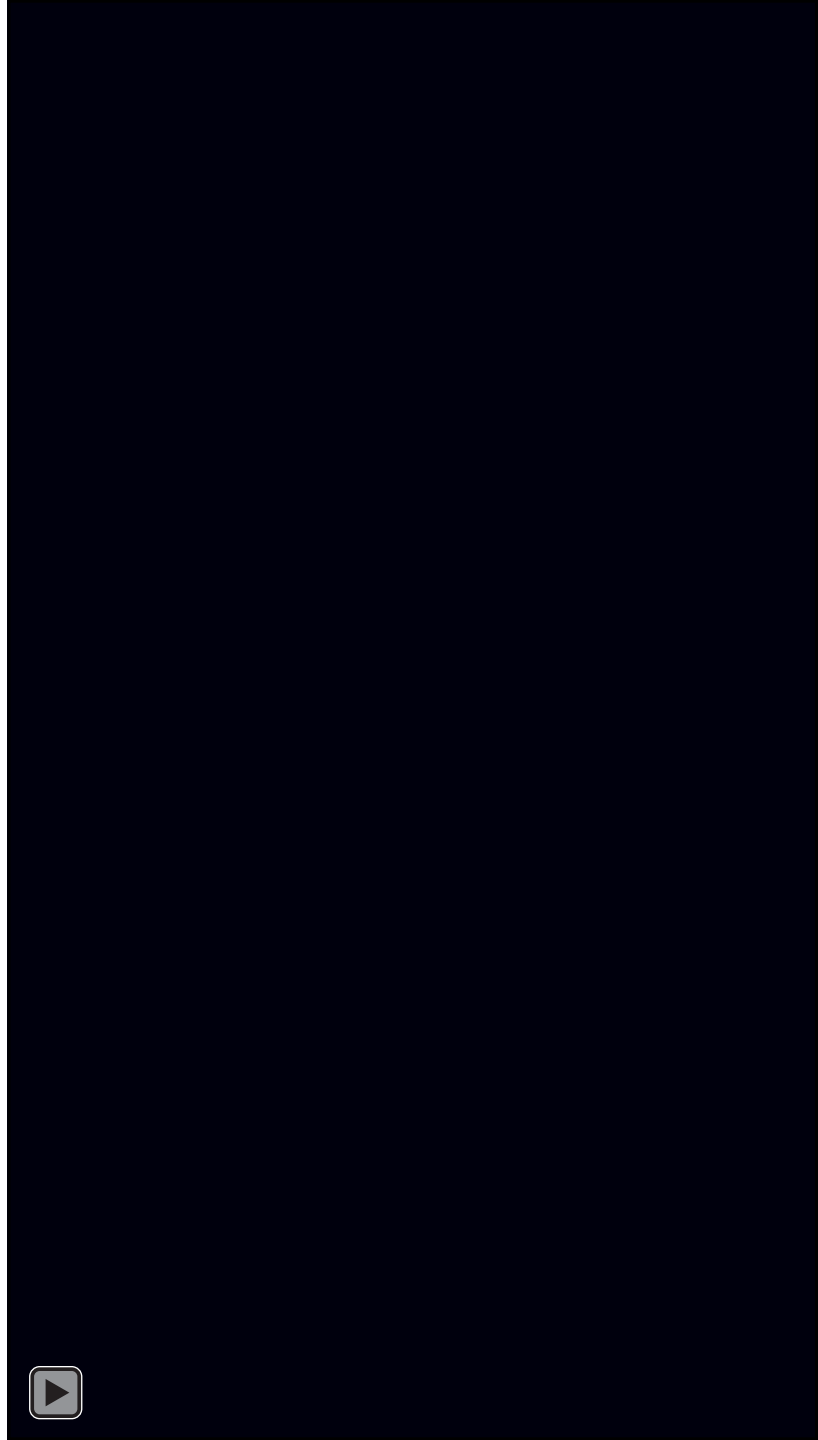
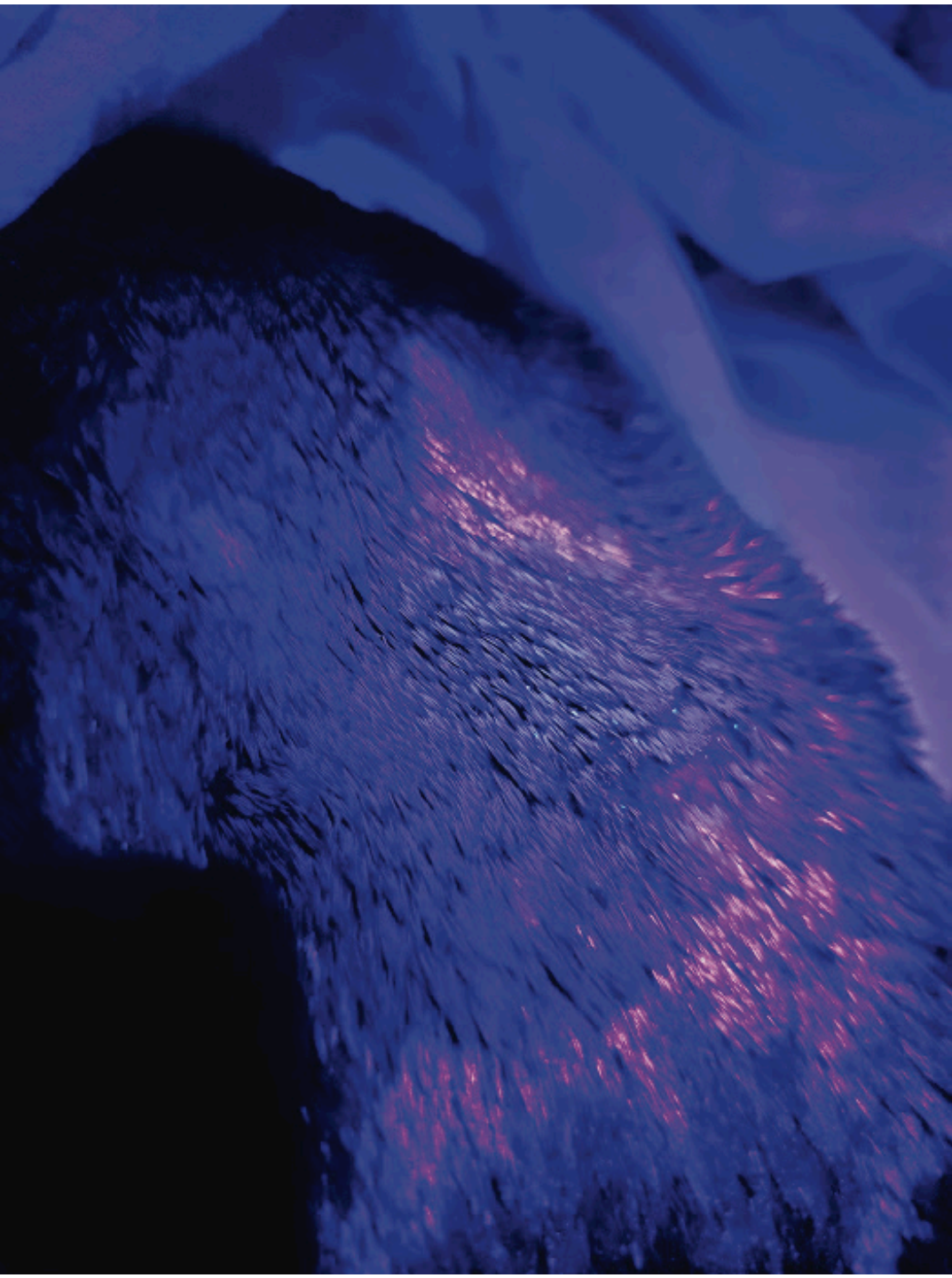
1. One of five species of monotreme
2. They don't have teeth
3. They have two types of fur
4. Eyes are closed when swimming
5. Females do not have nipples
6. Colonists thought they were a hoax!



Ornithorhynchus anatinus					
NOT EVALUATED	DATA DEFICIENT	LEAST CONCERN	 <b>NEAR THREATENED</b>	VULNERABLE	ENDANGERED
NE	DD	LC	NT	VU	EN
					CR
					EW
					EX



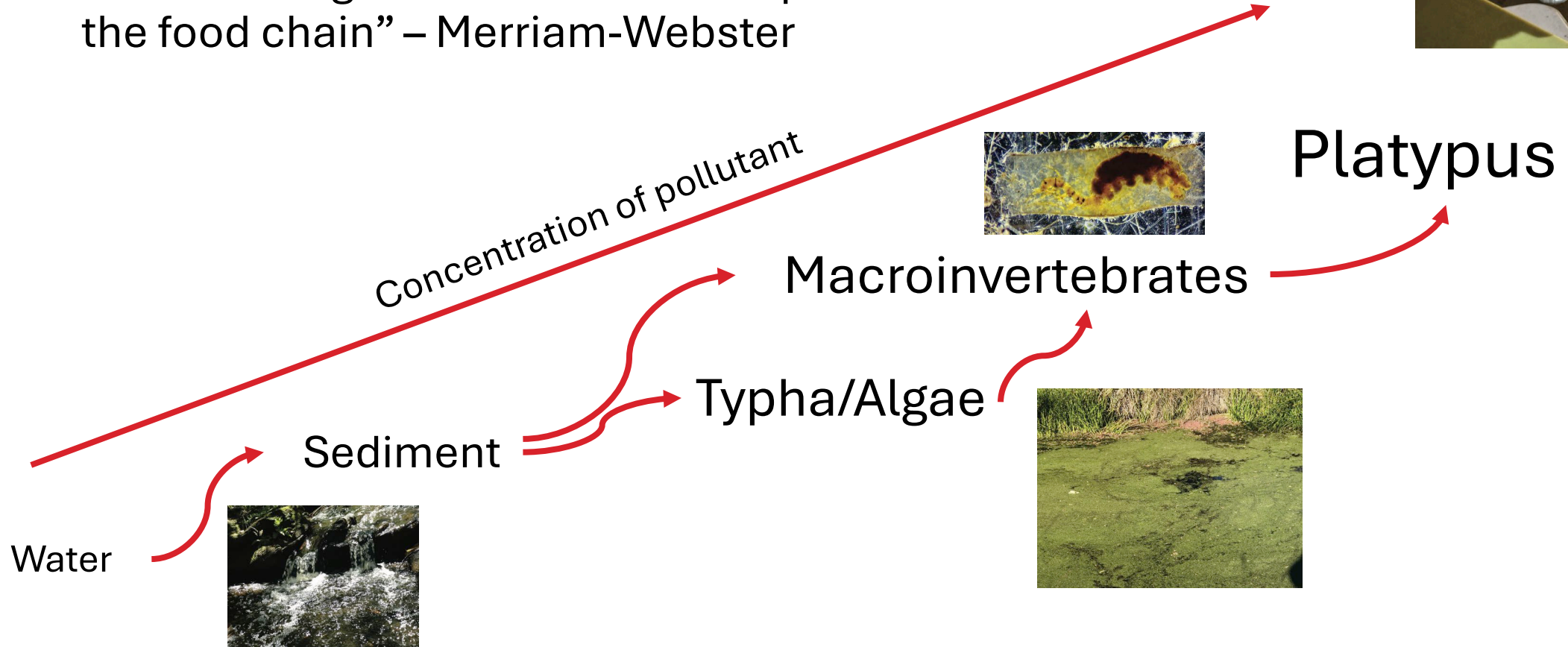






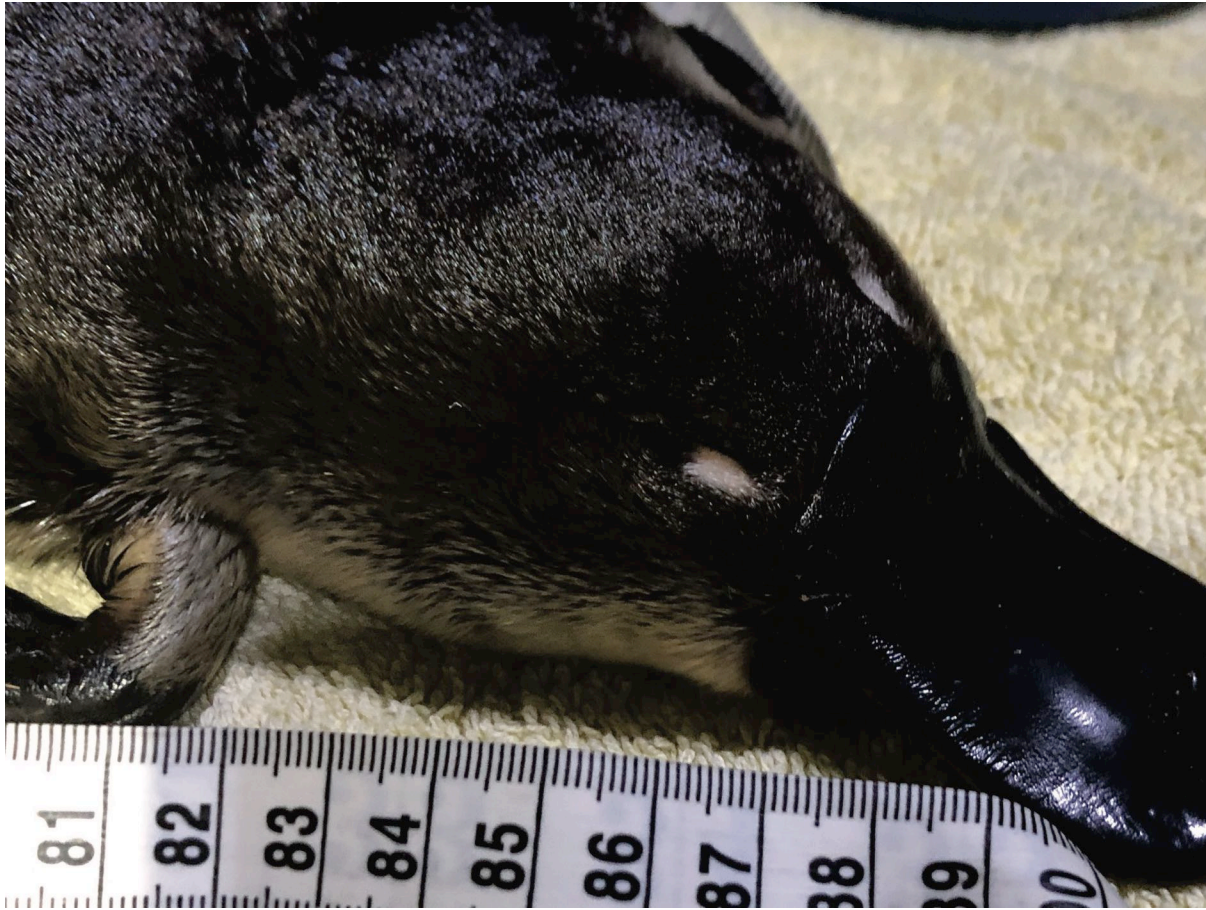
# Biomagnification

- “Process by which a compound increases in concentration in the tissues of organisms as it moves up the food chain” – Merriam-Webster





# Motivation



- Is EPL 1389 adequate for ensuring environmental protection?
- What is the end point of pollutants once they enter the water column?
- Platypuses are not considered when discussing ecosystem health.



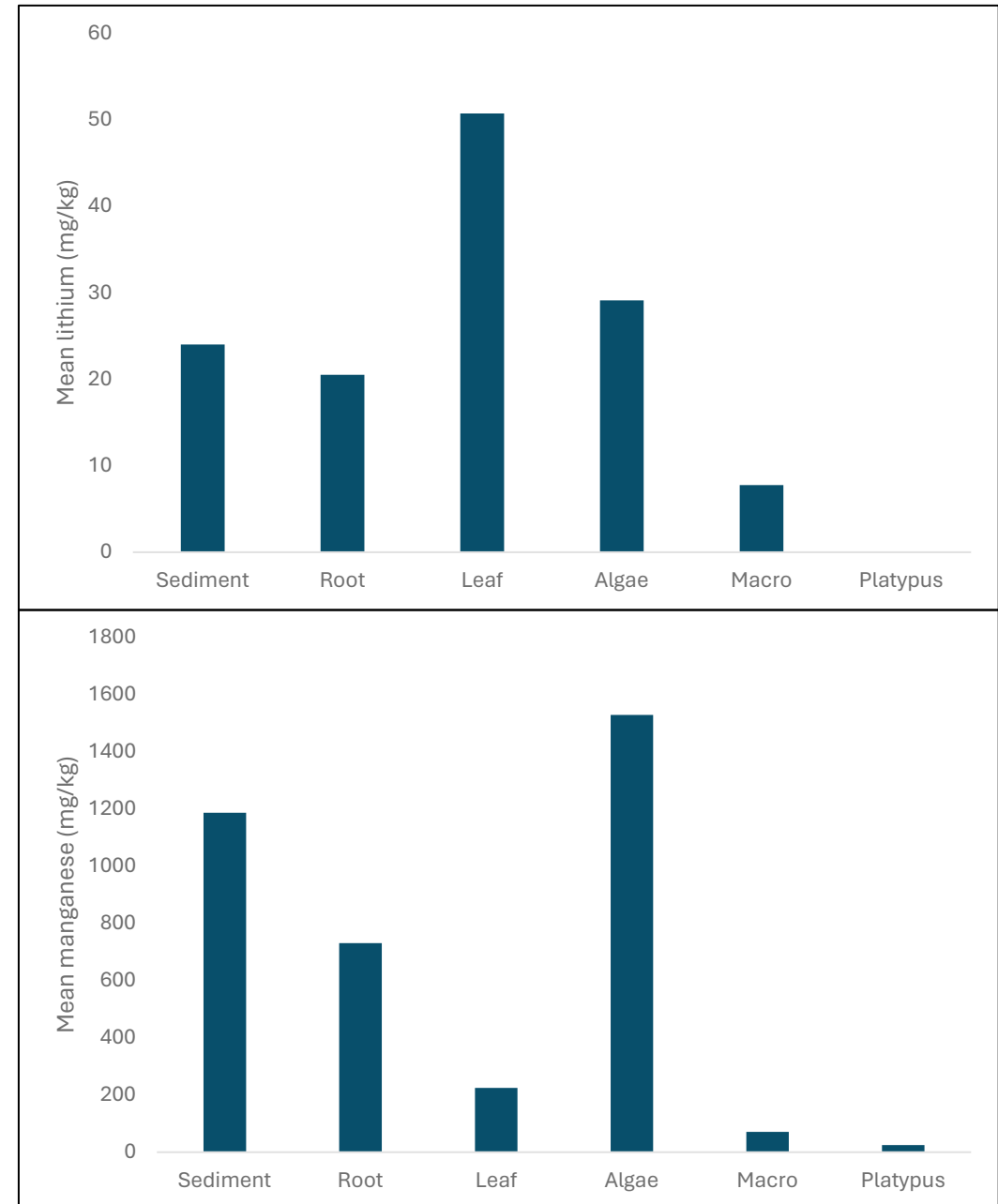
# Methodology





# Results

- Flora biota had the highest rates of biomagnification compared to fauna biota
- Lithium biomagnified highest in the Typha leaf
- Manganese biomagnified highest in the algae
- Typha roots had higher pollution concentration compared to Typha leaves







- Generally, platypus fur had considerably lower concentrations of pollutants than lower trophic levels.
- Lead, arsenic and strontium were not found in platypus fur!
- Platypus fur had higher concentrations of nickel and zinc compared directly with food source

# EPL 1389

## POINT 1

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Arsenic	micrograms per litre				200
Electrical conductivity	microsiemens per centimetre				2600
Nickel	micrograms per litre				200
Oil and Grease	milligrams per litre				10
pH	pH				6.5-9.0
Total suspended solids	milligrams per litre				30
Turbidity	nephelometric turbidity units				150
Zinc	milligrams per litre				300

## What's not listed

- Copper
- Lithium
- Manganese
- Strontium
- Barium
- Lead
- Aluminium
- Iron



# EPL 1389

## **L2 Concentration limits**

- L2.1 For each monitoring/discharge point or utilisation area specified in the table\ below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.
- L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.
- L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\.
- L2.4 Water and/or Land Concentration Limits



## What this means

- Aquatic plants, algae and sediment are the biggest accumulators' pollutants
- Platypus are not necessarily biomagnifying pollutants in their fur.
- Other studies of different species suggest fur as an excretory method.





